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ABSTRACT

Two experiments were conducted to determine the emergent reading levels of elementary school students. In the first experiment, 27 third grade and 27 sixth grade students of average reading ability from rural schools in central Florida were given pretest and posttest cloze passages on science materials two readability levels above their grade placement. Between the tests, one half of the students (the experimental group) received instruction on the material covered. The significant effect for treatment of both third and sixth grade cloze posttest data supported the construct of emergent reading levels based on the zone of proximal development. L. S. Vygotsky (1978) defined the zone of proximal development as the difference between students' actual and potential developmental level. Students' zone of proximal development appeared to be two levels above their instructional reading level. In the second experiment, baseline data were collected on the reading and vocabulary development of 23 fifth grade students from an urban north Florida school, comprehension pretests based on narrative passages were administered to all students, the experimental group received adult mediation, and all students completed comprehension posttests. Results indicated that students would be independent at reading level seven and instructional at level eight and above. The experiments suggested that emergent reading levels are a viable alternative to instructional reading level for placement in reading materials. (MM)

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Emergent Reading Levels In Expository and Narrative Materials

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Abstract

Emergent Reading Levels for third and sixth grade students (Experiment 1) and fifth grade students (Experiment 2) of average reading skill were exposed by the students' engagement in a highly difficult reading task (two levels upward from their measured reading achievement levels). Significant effects for treatment displayed emerging learning processes functioning as the experimental groups interacted in mediated situations. The mediated situations consisted of an adult defining and forming associations among unfamiliar vocabulary and concepts which were unique to the topics presented in the expository and narrative materials. It is suggested that Emergent Reading Levels offer a viable replacement for an Instructional Reading Level as a means of placement for reading instruction. Emergent Reading Levels obtained under the conditions of adult mediation focus on the child's developing cognitive reading activities instead of the child's previously developed level of cognitive operations.

Emergent Reading Levels in Expository and Narrative Materials

Diagnosis for instruction involves determining the child's developmental level of cognitive functioning for placement in instructional materials which are within tolerance limits of this predetermined level. The concept of instructional reading level introduced by Betts (1943) signifies the hierarchical developmental level at which instruction is aimed. The instructional reading level is based on the assumptions of Hullean psychological learning theory and taxonomic linguistics (Fodor, Bever, & Garrett, 1974). These assumptions include: (a) language is hierarchically organized; (b) a serial growth patterning of the child's developmental reading behavior; (c) learning to read involves learning to process the lowest level followed by learning to process each successive level; (d) as lower levels become more efficiently processed, more time may be spent processing higher levels (LaBerge & Samuels, 1974; Perfetti & Hogaboam, 1975) resulting in faster and more accurate word recognition and comprehension of text.

The traditional concept of instructional reading level is measured by an Informal Reading Inventory (IRI) which consists of passages of increasing language complexity with accompanying comprehension questions to be read and answered by the child without any adult prompting or support. It is assumed that the levels of reading processing complexity coincide with the levels of linguistic complexity inherent in the IRI passages. Grade norms signify the level of

linguistic complexity of the passages, and mastery of the successively graded passages signifies the learner's level of hierarchial reading processing skill. The three major standards or guidelines available to teachers for interpreting error ranges of the IRI are the Betts criteria (1943), the Cooper criteria (1952), and the Powell criteria (1970, 1981). Although these guidelines reflect a substantial improvement over the years (e.g., the Powell criteria places students at a higher instructional level) (Homan, 1978), they are based on the diagnostic principle that development is a prerequisite of learning. They match reading instruction to the child's fixed level of cognitive operations along the hierarchical continuum of levels of reading processing.

Several fundamental changes in the study of children's learning have occurred in the past decade which restructure American learning theory to shift its emphasis to the learner's side of the learner-environment equation (Brown, Bransford, Ferrara and Campione, 1982) with a cognitive-developmental approach. The child is viewed as an active organism continually extending, mediating and redefining its perceptions of the environment as opposed to the traditional role of the child as a passive organism responding to environmental influences which produce an incremental, quantitative growth of its knowledge base. The continuous processes of extending, mediating and redefining perceptions of the environment result in a qualitative restructuring of the mental functions of the developing child.

This qualitative restructuring of the mental functions is the underlying principle of Vygotsky's theory of child development (Vygotsky, 1981).

Cognitive and psycholinguistic development are based on social interaction between adult and child (Luria & Yudovich, 1971; Wozniak, 1975; Luria, 1978; Vygotsky, 1962). According to Soviet theory of activity, any higher mental function (i.e., those mediated by signs or sign systems) goes through an external stage of development because it is initially a social function between two people (Vygotsky, 1981). An adult's planning and directing function guides and regulates the child's activities, and this planning function gradually becomes the means by which the child is capable of moving from an other-regulated interpsychological plane to the self-regulated intrapsychological plane (Wertsch, 1977). The ongoing qualitative restructuring of mental functions of the developing child and the social interaction between the adult and child require a learner-in-context model of reading diagnosis and placement for instruction.

Vygotsky (1978) addresses the issues of diagnosis and placement for instruction with a new concept more indicative of the child's "emerging" mental functions--the zone of proximal development. Vygotsky's zone of proximal development is based on the principle that redefines cognitive operations in terms of emerging learning processes instead of the presence or absence of fixed, preordered though structures. According to Vygotsky's principle (1978), these emerging learning processes (a) designate the child's level of functioning in a mediated situation (i.e., under adult guidance

or in collaboration with capable peers) and (b) come to the surface for observation and diagnosis when the child is engaged in a highly difficult learning task.

If the zone of proximal development which is based on the principle that "instruction precedes development and leads it;" (Vygotsky, 1962, p. 104) is applied to diagnosis and placement for reading instruction, the traditional concept of instructional reading level is incomplete and problematic. All sets of existing criteria for interpreting errors and placement at the instructional reading level produce too low a level of placement (Powell, 1982) because instructional reading level is not obtained under the conditions of instruction or adult mediation. A new concept, Emergent Reading Levels, which encompasss the levels a pupil can sustain under adult mediation is needed for reading diagnosis and instruction (Powell, 1982).

The experimental studies reported here explore the concept of Emergent Reading Levels in a dynamic assessment context. The studies employ difficult reading tasks by using passages above the measured pupil reading achievement level to uncover the subjects' emerging level of cognitive functioning. The mediated situation includes discussion and explication of unfamiliar vocabulary and concepts contained in the passages, collaboration with capable peers in verbalizing previously acquired vocabulary and concepts, and adult guidance in organizing and interrelating these concepts

in relation to systematized adult structures.

EXPERIMENT 1

In experiment 1, cloze test passages form science materials were given to students using both the mediated dynamic assessment and the non-mediated static assessment procedures. This experiment tested the hypothesis that Emergent Reading Levels exist and may be diagnosed by student performance on a highly difficult content area reading task with mediation prior to testing.

Method

Design and Materials

A randomized blocks 2 x 2 analysis of covariance factorial design was used with two levels for each variable. The first variable, treatment, consisted of mediated and non-mediated. Levels of the second variable were grade three and grade six.

For both grade levels, two passages of 250 to 450 words in length were selected from science textual materials. The passages were presented as pretest and posttest measures in the standard cloze format with every fifth word deleted. The two cloze passages presented to each group were two readability levels above each group's present grade placement (i.e., grade 3 received passages at fifth grade readability; grade 6 received passages at eighth grade readability). The Harris-Jacobson Readability Formula was preferred by the experimenters because it includes a parameter of a data set of unique, unfamiliar words, and a word base is crucial to the

child's understand of the concpets presented in the science passages.

Study sheets for each grade consisted of a list of the major concepts presented in the cloze passages with accompanying diagrams. The third grade cloze passages dealt with the subject of body waste, and the sixth grade cloze passages were about the earth's water cycle. The major concepts were presented in sentence form with highlighted vocabulary words which were unique to the two topics as follows:

Third grade. The excretory system removes waste from the body. The kidneys are two organs which remove liquid waste from the blood.

Sixth grade. Water moves from the atmosphere to the ground as rain, snow and hail.

Water moves from the ground to the atmosphere by evaporation.

Vocabulary words which were unique to the two topics were highlighted in the study sheets. The diagrams were reproduced on transparencies for presentation on an overhead projector.

Subjects

Subjects were 27 third graders and 27 sixth graders from rural schools in central Florida. Since the study was designed to explore the concept of Emergent Reading Levels in relation to classroom reading instruction, subjects chosen included an entire reading

classroom of homogeneously grouped students. Subjects in each grade were paired on total reading scores of the Gates-MacGinite Reading Test and randomly assigned to a condition (control or experimental) to control for regression toward the mean in post-testing by assuring equal distribution of reading ability in all groups. Average reading achievement levels as measured by the Gates-MacGinitie Reading Test grade equivalent scores were as follows: third grade control (M=3.3) and experimental (M=3.3), and sixth grade control (M=6.6) and experimental (M=6.6). Additional baseline information on subjects included a cloze test on science content area passages on level three readability for third grade and level six for sixth grade. No significant differences were present between the experimental and control groups on third grade F (1, 25) = .082, $p < .05$ or on sixth grade F (1, 25) = .045, $p <$ .05 baseline cloze passages.

Procedures

The experiment was conducted in two sessions for each grade, third and sixth. During the first session, the third graders completed the level five cloze pretest, and the sixth graders completed the level eight cloze pretest with no adult mediation for both grades prior to testing. There was a 48 hour interval between session 1 and session 2.

Session 2 consisted of adult mediation for third and sixth grade experimental groups and no adult mediation for both control

groups followed by the cloze posttest science passages. To control for information gain due to the reading of textual material in the science areas presented, no textual material was read by the subjects in any group in this experiment.

Adult mediation for both experimental groups lasted 20-25 minutes and followed a continuous cycle of adult oral/visual presentation--student feedback--adult oral/visual clarification. Study sheets were distributed to the subjects. The highlighted vocabulary words were also presented visually on the chalkboard for third graders. The experimenter highlighted and pronounced the word, the subjects and the experimenter pronounced the word together, and the subjects pronounced the word alone. This three-step process was repeated several times until the subjects were able to pronounce the word at sight independent of adult mediation. The experimenter then directed the subjects' attention to the corresponding concept listed on the study sheet, read the concept to the subjects, and explicated the concept with the diagram on the overhead projector. Subjects' discussion and feedback for clarification were elicited by the experimenter by converting the concepts to oral questions as follows:

Concept. The excretory system removes waste from the body.

Question. What is waste?

What removes waste from the body?

What does the excretory system do?

The spontaneous cycle of adult presentation--student feedback--adult

clarification was repeated for each concept presented consecutively down the study sheets. Following a ten minute rest interval for the experimental groups, both experimental and control groups completed the posttest cloze passages.

Results

The analysis-of-covariance design was used to control statistically any initial differences in the subjects which might have been present and which might confound differences between the two groups of each grade level of subjects. The cloze pretest for both grade level groups were separately analyzed with the Gates-MacGinitie Reading Test as a covariate on each analysis. The analysis yielded no significant differences on pretests between third grade groups F (1, 25) = 1.95, $p < .05$ and sixth grade groups F (1, 25) = .51, $p < .05$. An analysis of the cloze posttest dependent variables with the matching pretest as covariates showed a significant effect for treatment in third grade, F (1, 25) = 10.96, $p < .003$, and a significant effect for sixth grade, F (1, 25) = 10.77, $p < .004$.

Discussion

The significant effect for treatment of both third and sixth grade cloze posttest data support the construct of Emergent Reading Levels, based on the zone of proximal development. Vygotsky (1978) defined the zone of proximal development as the difference between a student's actual developmental level and his or her level of potential development. The cloze pretests and posttests were highly difficult

tasks at two readability levels above the mean reading achievement level of both sixth grade groups (M=6.6) and both third grade groups (M=3.3). Experimental groups in the mediated situation showed a substantial average percentage point increase from pretest to post-test as compared to control groups who had no engagement in a mediated situation: sixth grade = 9% increase; third grade = 9% increase. This increase indicates that the experimental groups were operating within their zone of proximal development two levels upward from their instructional reading level.

Although Experiment 1 showed that Emergent Reading Levels or a zone of potential development exists, the range of this zone (i.e. the upward levels it encompasses) needs further investigation. A second experiment was designed to test the hypothesis that the range of a student's zone of potential development may be identified through measures of narrative IRI passages or vocabulary development.

EXPERIMENT 2

In experiment 2 narrative passages of increasing linguistic complexity with accompanying comprehension questions were give to students using both the mediated dynamic assessment and non-mediated static assessment procedures. Word lists of increasing difficulty were administered to test the hypothesis that a measure of vocabulary development would be indicative of students' zone of potential development.

Method

Design and Materials

A randomized blocks analysis of covariance factorial design was used with two levels for the independent variable. The two levels were mediated and non-mediated groups.

Two seventh grade level passages and two eighth grade level passages of 350 to 450 words in length were selected from unfamiliar children's fables. Readability levels of the passages were assessed using the Schuyler (1982) readability computer program which computes seven readability formulas. Passage difficulty was assigned according to the visual median of the seven different error ranges. The passages were presented in a pretest-posttest silent IRI format. Ten multiple-choice comprehension questions (3 literal, 3 inferential, 3 vocabulary-in-context, and 1 evaluative) were developed for each passage.

Brief study sheets which included pertinent vocabulary and literary concepts were developed for each fable. Five to seven unfamiliar words were selected from each fable and presented with a definition and in a sentence context as follows:

Ignited: to set fire to something. She ignited the liquid with a hot coal.

Literary concepts (i.e., setting, characters, plot, etc.) selected from each fable were introducted in a single sentence format as follows:

1. In every story, the main character must set out to do something.

2. Characters in a fable are animals who talk and act like people.

Subjects

Subjects were 23 fifth graders from an urban north Florida school. Subjects were chosen from two adjacent fifth grade classrooms on the basis of average reading achievement scores (M=6.4) on the Gates-MacGinitie Reading Test. Since the experiment was conducted during the last month of the students' fifth grade school year, grade equivalent scores were based on norms for May. Subjects were considered to be of average reading achievement because reading achievement tests such as the Gates-Macginitie tend to overestimate reading placement. Students were paired on total reading scores of the Gates-MacGinitie Reading Test and randomly assigned to a condition (control or experimental) to assure equal distribution of reading ability in all groups. Additional baseline information on subjects included a silent IRI at the sixth grade passage level. No significant differences were present between the experimental (M=6.3) and control (M=6.5) groups. The Peabody Picture Vocabulary Test (PPVT) further confirmed similarities between control (M=108) and experimental (M=105) groups on a measure of receptive vocabulary competence. The vocabulary section of the Stanford-Binet Intelligence Test was administered as a measure of vocabulary

development and revealed no significant differences between control ($\underline{M}$=11-6) and experimental ($\underline{M}$=11-8) groups.

Procedure

The experiment consisted of four stages: (a) collection of baseline data, (b) administration of pretests, (c) mediation and (d) administration of posttests. The experiment was conducted in a series of thirty-minute sessions over a three week time period. Collection of baseline data began with individual testing sessions. The PPVT and the vocabulary section of the Stanford-Binet were administered according to the standardized testing procedures outlined in the respective manuals. A group testing session was used to administer the sixth grade level silent IRI. Following silent reading of the passage, subjects answered the multiple-choice questions which were orally read to them by the experimenter.

Administration of the seventh and eight grade level pretest IRI passages was also conducted in a group session. Pretest passages were silently read by the subjects with the experimenter again orally reading the accompanying comprehension questions to them.

Adult mediation which consisted of an interactive dialogue between experimenter and students on pertinent vocabulary and literary concepts contained in the fable passages was conducted with the experimental group. Study sheets were distributed to the subjects. An unfamiliar vocabulary word and its accompanying definition was read and explained by the experimenter. Student volunteers orally read a sentence containing the highlighted

vocablulary word. The experimenter then asked for a volunteer to redefine the word. This three-step interactive process was repeated several times until the subjects were able to pronounce and define the word independent of adult mediation. This cycle of adult presentation--student feedback--adult clarification continued through the remaining five to seven vocabulary words on the study sheet. The experimenter then directed the subjects' attention to the literary concepts listed on the study sheet. Student volunteers orally read each concept presented consecutively down the study sheet. The entire mediated situation required approximately twenty minutes (i.e., ten minutes per study sheet).

Following each of the ten minute mediation sessions, subjects in the experimental group silently read the accompanying seventh and eighth grade level passages. The experimenter read aloud the posttest multiple-choice comprehension questions, and subjects marked their answers on an answer sheet. This same procedure was followed with subjects in the control group who engaged in no mediation prior to posttesting.

Results

The analysis-of-covariance design was used to control statistically any initial differences in reading ability which might have been present and which might confound differences between performance of the experimental and control groups on the posttest. An analysis of the two levels of the dependent variable (silent IRI

posttests) with the matching pretests as covariates showed a significant effect for treatment at the seventh grade level F (1,21) = 6.40, $p < .02$ and at the eighth grade level F (1,21) = 10.08, $p < .005$.

Two multiple correlations were obtained to assess vocabulary development scores as criterion of the predictor variable, zone of proximal development. Since posttest scores on the mediated silent IRI passages were shown in the previous analysis-of-covariance to reflect the subjects' zone of proximal development, baseline level six, posttest level seven and level eight residual gains were selected as predictor variables for the computation of the multiple correlations. The multiple R for the vocabulary section of the Stanford-Binet Intelligence Test MA scores was R=.66 F (3,19)=4.81, $p < .11$ and the multiple R for the PPVT DIQ scores was R=32 F (3,19) = .74, $p < .54$.

These correlations failed to reach significance at the $p < .05$ level.

Discussion

The experimenters conclude that Emergent Reading Levels based on Vygotsky's (1978) zone of proximal development are a viable alternative to instructional reading level. They may be brought to the surface for observation and diagnosis using a dynamic testing procedure which includes adult mediation on a highly difficult reading task.

Results of Experiment 2 show that the fifth grade experimental group participating in a dynamic testing situation with the mediated silent comprehension IRI test have Emergent Reading Levels at the seventh ($\underline{M}$ = 94%) and the eighth ($\underline{M}$ = 85%) grade levels. Applying the Betts (1943) criteria for determining reading competency levels, the control groups are instructional at level seven ($\underline{M}$ = 86%) and frustrational at level eight ($\underline{M}$ = 65%). Using the traditional instructional reading level of the IRI, students would be underplaced in sixth or seventh grade reading materials. Emergent Reading Levels show that these students would be independent at level seven and instructional at level eight and above.

The results of Experiment 1 also confirm the existence of Emergent Reading Levels for dynamic assessment groups tested with the cloze procedure. Third grade experimental groups show a 9% increase on a level five cloze test, and sixth grade experimental groups show a 9% increase on a level eight cloze test with a mediated situation as compared to their respective non-mediated control groups.

Vocabulary development scores as measured by the Stanford-Binet and PPVT fail to correlate significantly with students' zone of proximal development. These measures of vocabulary development are static testing devices which determine students' actual developmental level through independent problem solving. In contrast, the dynamic testing IRI and cloze procedures described in Experiments 1 and 2 contain adult mediation which is needed to tap students' higher

levels of potential development. Instruction should be aimed at these emerging levels of cognitive development (Vygotsky, 1978).

Instructional reading level is also determined through static testing procedures which measure students' previously developed levels of reading performance. It ignores the adult mediation or instructional dimension of a developmental reading context (Powell, 1982) and results in underplacement in classroom reading instruction. Diagnosis of Emergent Reading Levels through dynamic testing procedures and classroom placement according to these levels insure maximum reading growth by teaching upward to the child's developing cognitive processes.

Although Experiments 1 and 2 provide the initial empirical evidence that Emerging Reading Levels are a viable alternative to instructional reading level for placement in reading materials, further investigation is needed. Dynamic testing procedures for reading diagnosis must be developed for classroom use. Adult mediated instructional techniques must also be developed with specifications for classroom application.

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